



Transportation Synthesis Report

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Flexible Pavement Research Partnerships

Prepared for
Wisconsin Highway Research Program
Flexible Pavements Technical Oversight Committee

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Transportation Synthesis Reports are brief summaries of currently available information on topics of interest to WisDOT technical staff. Online and print sources for TSRs include NCHRP and other TRB programs, AASHTO, the research and practices of other transportation agencies, and related academic and industry research. Internet hyperlinks in TSRs are active at the time of publication, but changes on the host server can make them obsolete.

Request for Report

WHRP's Flexible Pavements TOC is interested in learning about pooled fund research and other partnership opportunities for flexible pavement research, a key element in the TOC's Five-Year plan for research attention.

Summary

There are numerous opportunities to pool research resources with other state transportation agencies, federal agencies, and industry groups. To assist the TOC in identifying partnering opportunities, we gather in this report Web sites and other information on organizations that appear willing to work with WisDOT and other agencies on flexible pavement research.

The **Transportation Pooled Fund Program** overseen by the Federal Highway Administration offers the most visible starting point for such opportunities, and a number of recently awarded and contracted studies remain open to WisDOT participation. We then turn to **FHWA** and its relevant programs, then to the **Superpave** program and its regional centers around the country, followed by **university-based research centers**. We conclude with a handful of **industry-based organizations** with an interest in cooperative research relationships.

Transportation Pooled Fund Program

After reviewing this comprehensive list of FHWA-supported pooled fund studies, we selected studies proposed, contracted and under way that pertain to Wisconsin flexible pavement interests. The list does not include pooled fund projects in which WisDOT is already a partner. <http://www.pooledfund.org/>.

Flexible Pavement – Current Projects. The following projects are devoted solely to flexible pavement research.

- TPF-5 (010). Structural Improvement of Flexible Pavements Using Geosynthetics for Base Course Reinforcements. <http://www.pooledfund.org/projectdetails.asp?id=126&status=4>. Dale Peabody, Maine Department of Transportation, Dale.Peabody@maine.gov, 207-624-3305.
- TPF-5 (019). Full-Scale Accelerated Performance Testing for Superpave and Structural Validation. <http://www.pooledfund.org/projectdetails.asp?id=11&status=6>. Jack Youtcheff, FHWA, Jack.Youtcheff@fhwa.dot.gov, 202-493-3090.
- TPF-5 (072). NCAT Pavement Test Study (extension of SPR-3 (085)). <http://www.pooledfund.org/projectdetails.asp?id=297&status=6>. Jeff Brown, Alabama Department of Transportation, brownje@dot.state.al.us, 334-353-6941.
- TPF-5 (080). Investigation of Low Temperature Cracking in Asphalt Pavements. <http://www.pooledfund.org/projectdetails.asp?id=311&status=6>. Ben Worel, Minnesota Department of Transportation, ben.worel@dot.state.mn.us, 651-779-5522.

- TPF-5 (124). Accelerated Performance Testing on the 2006 NCAT Pavement Test Track. <http://www.pooledfund.org/projectdetails.asp?id=374&status=6>. Jeff Brown, Alabama Department of Transportation, brownje@dot.state.al.us, 334-353-6941.
- TPF-5 (128). Accelerated Implementation of Intelligent Compaction Technology for Embankment Subgrade Soils, Aggregate Base and Asphalt Pavement Material. <http://www.pooledfund.org/projectdetails.asp?id=359&status=4>. FHWA, John D'Angelo, john.d.angelo@fhwa.dot.gov, 202-366-0121.
- TPF-5 (146). Evaluation of Modified Performance Grade Binders in Thin Lift Maintenance Mixes, Surface Mix, and a Reflective Crack Relief Layer Mix. <http://www.pooledfund.org/projectdetails.asp?id=373&status=4>. Massachusetts Highway Department, Stephen Pepin, stephen.pepin@dot.state.ma.us, 617-973-8051.

Flexible Pavement – Prospective Projects. The following project solicitations have not yet been contracted.

- 1042. HMA Surface Characteristics related to Ride, Texture, Friction, Noise, Durability (MnROAD Study). <http://www.pooledfund.org/projectdetails.asp?id=1042&status=1>. James Klessig, Minnesota Department of Transportation, jim.klessig@dot.state.mn.us, 651-282-2472.
- 1044. Investigation of Low Temperature Cracking in Asphalt Pavements – Phase II (MnROAD Study). <http://www.pooledfund.org/projectdetails.asp?id=1044&status=1>. James Klessig, Minnesota Department of Transportation, jim.klessig@dot.state.mn.us, 651-282-2472.
- 1050. Recycled Asphalt Pavements (MnROAD Study). <http://www.pooledfund.org/projectdetails.asp?id=1050&status=1>. James Klessig, Minnesota Department of Transportation, jim.klessig@dot.state.mn.us, 651-282-2472.
- 1064. Optimal Timing of Preventive maintenance for Addressing Environmental Aging in HMA Pavements (MnROAD Study). <http://www.pooledfund.org/projectdetails.asp?id=1064&status=1>. James Klessig, Minnesota Department of Transportation, jim.klessig@dot.state.mn.us, 651-282-2472.

Pavement Generally. The following projects focus on pavements generally, including flexible pavement.

- TPF-5 (013). Effect of Multiple Freeze-Thaw Versus Deep Frost Penetration on Pavement Performance. <http://www.pooledfund.org/projectdetails.asp?id=2&status=6>. Larry Wiser, FHWA, Larry.Wiser@fhwa.dot.gov, 202-493-3079.
- TPF-5 (028). Product Evaluation – Highway Innovative Technology Evaluation Center. <http://www.pooledfund.org/projectdetails.asp?id=18&status=4>. Terry Halkyard, FHWA, terry.halkyard@fhwa.dot.gov, 202-493-3467.
- TPF-5 (039). Falling Weight Deflectometer (FWD) Calibration Center and Operational Improvements. <http://www.pooledfund.org/projectdetails.asp?id=28&status=6>. Eric Weaver, FHWA, Eric.Weaver@fhwa.dot.gov, 202-493-3153.
- TPF-5 (045). Performance Guidelines for the Selection of Hot-Pour Crack Sealants. <http://www.pooledfund.org/projectdetails.asp?id=24&status=4>. Kevin McGhee, Virginia Department of Transportation, Kevin.McGhee@VirginiaDOT.org, 434-293-1956.
- TPF-5 (048). Midwest States Accelerated Testing. <http://www.pooledfund.org/projectdetails.asp?id=236&status=6>. Richard McReynolds, Kansas Department of Transportation, dick@ksdot.org, 785-291-3841.
- TPF-5 (054). Development of Maintenance Decision Support System. <http://www.pooledfund.org/projectdetails.asp?id=240&status=6>. David Huft, South Dakota Department of Transportation, dave.huft@state.sd.us, 605-773-3358.
- TPF-5 (070). International Conference on Accelerated Pavement Testing. <http://www.pooledfund.org/projectdetails.asp?id=298&status=4>. James Klessig, Minnesota Department of Transportation, jim.klessig@dot.state.mn.us, 651-282-2472.
- TPF-5 (079). Implementation of the 2002 AASHTO Design Guide for Pavement Structures. <http://www.pooledfund.org/projectdetails.asp?id=301&status=6>. Richard McReynolds, Kansas Department of Transportation, dick@ksdot.org, 785-291-3841.
- TPF-5 (088). NDE/NDT for Highways and Bridges. <http://www.pooledfund.org/projectdetails.asp?id=310&status=4>. FHWA, Frank Jalinoos, frank.jalinoos@fhwa.dot.gov, 202-493-3082.
- TPF-5 (090). Pavement Tools Consortium. <http://www.pooledfund.org/projectdetails.asp?id=323&status=4>. Leni Oman, Washington Department of Transportation, OmanL@wsdot.wa.gov, 360-705-7974.
- TPF-5 (101). Evaluations and Applications of Mechanistic Performance Prediction Modeling Tools. <http://www.pooledfund.org/projectdetails.asp?id=334&status=6>. FHWA, Imad Basheer,

- TPF-5 (112). Midwest States Pooled Fund Pavement Preservation Partnership. <http://www.pooledfund.org/projectdetails.asp?id=343&status=4>. Michigan Department of Transportation, Kevin Kennedy, kennedyk@michigan.gov, 517-322-6043.
- TPF-5 (121). Monitoring and Modeling of Pavement Response and Performance. <http://www.pooledfund.org/projectdetails.asp?id=353&status=4>. Ohio Department of Transportation. Karen Pannell, Karen.Pannell@dot.state.oh.us, 614-387-2710.
- TPF-5 (127). Consortium of Accelerated Pavement Testing (CAPT) and Technical Exchange Partnership. <http://www.pooledfund.org/projectdetails.asp?id=358&status=4>. FHWA, Nelson Gibson, Nelson.Gibson@fhwa.dot.gov, 202-493-3073.
- TPF-5 (136). High Speed Pavement Analyzer. <http://www.pooledfund.org/projectdetails.asp?id=365&status=4>. Chris Brakke, Iowa Department of Transportation, chris.brakke@dot.iowa.gov, 515-239-1882.
- TPF-5 (141). Pavement Surface Properties Consortium: A Research Program. <http://www.pooledfund.org/projectdetails.asp?id=371&status=4>. Virginia Department of Transportation, Bill Kelsh, Bill.Kelsh@VDOT.Virginia.gov, 434-293-1904.
- SPR-3 (073). Micro-Surface Mix Design Procedure. <http://www.pooledfund.org/projectdetails.asp?id=224&status=4>. Joe Holland, California Department of Transportation, t.joe.holland@dot.ca.gov, 916-227-5825.
- SPR-3 (074). Pavement Research and Technology. <http://www.pooledfund.org/projectdetails.asp?id=144&status=4>. Linda Pierce, Washington Department of Transportation, PierceL@wsdot.wa.gov, 360-705-7974.

Pavement Generally – Prospective Projects. The following project solicitations focus on pavements generally, including issues pertaining to flexible pavement.

- 974. Technology Transfer Toolbox: A Research Implementation How-To Guide. <http://www.pooledfund.org/projectdetails.asp?id=974&status=1>. Cindy Mershon Scott, Pennsylvania Department of Transportation, cyscott@state.pa.us, 717-214-8684.
- 1040. The Effects of Implements of Husbandry “Farm Equipment” on Pavement Performance (MnROAD Study). <http://www.pooledfund.org/projectdetails.asp?id=1040&status=1>. James Klessig, Minnesota Department of Transportation, jim.klessig@dot.state.mn.us, 651-282-2472.
- 1140. Improving Resilient Modulus (MR) Test Procedures for Unbound Materials. <http://www.pooledfund.org/projectdetails.asp?id=1140&status=1>. Willian Zaccagnino, FHWA, william.zaccagnino@fhwa.dot.gov, 202-493-3183.

FHWA

This U.S. Department of Transportation Agency works in countless cooperatives, programs, and initiatives to further pavement research, marshal resources, and disseminate information. <http://www.fhwa.dot.gov>. Specific significant programs include:

Asphalt Research at Turner-Fairbank Highway Research Center. The various asphalt laboratories and research programs at Turner-Fairbank do partner with state transportation agencies on occasion to coordinate research efforts. See Asphalt Pavement Technology Research at <http://www.fhwa.dot.gov/pavement/asphalt/asphalt.cfm>; Asphalt Laboratories, <http://www.tfhrc.gov/about/asphalt.htm>.

- Binder Laboratory, <http://www.tfhrc.gov/about/asphalt.htm#Binder>.
- Bituminous Mixes Laboratory, <http://www.tfhrc.gov/about/asphalt.htm#Bituminous>.
- Simulation, Imaging, and Mechanics of Asphalt Pavements Laboratory, <http://www.tfhrc.gov/about/asphalt.htm#Simulation>.

Long Term Pavement Performance. Since the late 1980's the LTPP program has gathered performance data on pavements around the country, and asphalt pavement researchers in Wisconsin and around the country have accessed this data for several years. See <http://www.fhwa.dot.gov/pavement/ltpp/index.cfm> and LTPP Letter Reports, http://www4.trb.org/trb/dive.nsf/web/ltpp_letter_reports.

Superpave Program and Regional Centers

Superpave developed out of joint work between AASHTO and FHWA through TRB's Strategic Highway Research Program. The Superpave Regional Centers serve the SHRP's Superpave program by conducting research enjoining multiple state agencies and research institutions. Pooled state research remains a central goal of the program. See <http://www.superpave.psu.edu/superpave/centers.html> and FHWA pages devoted to Superpave at <http://www.fhwa.dot.gov/pavement/asphalt/regional.cfm>.

Regional Centers. Centers can assist states in initial specific pavement studies design, verification, and in-place pavement analysis as part of the LTPP program. The five regional centers include:

- North Central Superpave Center: <http://cobweb.ecn.purdue.edu/~spave/>. WisDOT has contributed to this pooled fund effort in the last several years.
- Northeast Superpave Center: <http://www.superpave.psu.edu/>.
- Western Regional Superpave Center: <http://www.wrsc.unr.edu/>.
- Southeastern Superpave Center: <http://www.eng.auburn.edu/center/ncat/ssc/ssc.html>.
- South Central Superpave Center: http://tti.tamu.edu/groups/program.htm?p_org_code=SC-BDV.

Agency Partner. According to FHWA, the Asphalt Institute is responsible for development, implementation and training of state agencies in Superpave mix design and analysis. For further information on the Asphalt Institute and its work with Superpave, see

http://www.asphaltinstitute.org/ai_pages/Technical_Focus_Areas/Tech_Issues_Superpave.asp. For its online magazine, Asphalt, see http://www.asphaltinstitute.org/ai_pages/AI_Magazine/.

University-Based Transportation Research Centers

Following is a list of university-based research centers that focus on asphalt specifically, have produced research on HMA or on relevant pavement issues, or focus on pavements generally. For information on the University Transportation Centers program, of which several of the centers listed below are members, see <http://utc.dot.gov/>.

- Center for Advanced Transportation Systems Simulation, University of Central Florida: <http://catss.engr.ucf.edu/>.
- Center for Infrastructure Engineering Studies, University Transportation Center, University of Missouri-Rolla: <http://campus.umr.edu/utc/>.
- Center for Transportation Research, University of Texas at Austin: <http://www.utexas.edu/research/ctr/>.
- Center for Transportation Research and Education, Iowa State University: <http://www.ctre.iastate.edu/>.
- Center for Transportation Studies, University of Minnesota: <http://www.cts.umn.edu/>.
- Institute for Safe, Quiet, and Durable Highway Pavements, Purdue University: <http://widget.ecn.purdue.edu/~sqdh/>.
- Kentucky Transportation Center, University of Kentucky: <http://www.ktc.uky.edu/>.
- Kiewit Center for Infrastructure and Transportation, Oregon State University: <http://kiewit.oregonstate.edu/>.
- Louisiana Transportation Research Center, Louisiana State University and Louisiana Department of Transportation: www.ltrc.lsu.edu/.
- Mack-Blackwell Rural Transportation Center at the University of Arkansas, Fayetteville: <http://www.mackblackwell.org/>.
- Michigan State University, Civil and Environmental Engineering: <http://www.egr.msu.edu/cee/>.
- Michigan Tech University Transportation Center: <http://www.trans.mtu.edu/>.
- Michigan Tech University Transportation Materials Research Center: <http://www.tmrc.mtu.edu/>.
- Mid-Atlantic Universities Transportation Center, Pennsylvania State University: <http://www.pti.psu.edu/mautc/>.
- Mississippi State University: Transportation Research Center: <http://www.civil.msstate.edu/cmrc.htm>.
- Mississippi State University Transportation Research Center: <http://www.civil.msstate.edu/transres.htm>.
- Mountain-Plains Consortium, North Dakota State University: <http://www.mountain-plains.org/>.
- National Center for Asphalt Technology, Auburn University: <http://www.ncat.us/>.
- National Institute for Advanced Transportation Technology, University of Idaho: <http://www.webs1.uidaho.edu/niatt/>.
- Southwest Region University Transportation Center, Texas A&M University: <http://swutc.tamu.edu/>.
- UC-Berkeley Institute of Transportation Studies Pavement Research Center (which has evolved from an asphalt research center): <http://www.its.berkeley.edu/pavementresearch/index.htm>.
- University of Illinois at Urbana-Champaign Transportation Engineering Group:

<http://cee.uiuc.edu/transportation/default.asp>.

- University of Calgary, Department of Civil Engineering, Materials Science: <http://www.schulich.ucalgary.ca/Civil/Materials/index.html>.
- University of Rhode Island Transportation Center: <http://www.urtc.uri.edu/>.
- Washington Center for Asphalt Technology, Washington State University: www.ce.wsu.edu/WCAT/.
- Western Research Institute, University of Wyoming: <http://www.westernresearch.org/>.
- Western Transportation Institute, Montana State University: <http://www.coe.montana.edu/wti/>.

Other Potential Partners

Among the vast number of industry organizations and cooperatives, the following three state an interest in partnership on their Web sites.

Asphalt Institute. <http://www.asphaltinstitute.org>. The Asphalt Institute fulfills key functions of the FHWA's Superpave program, as described under Federal Highway Administration, above.

National Asphalt Pavement Association. <http://www.hotmix.org/>. NAPA plays a role in certain asphalt research dissemination projects. For example, NAPA, AASHTO, FHWA, and the asphalt pavement association of Indiana jointly put together the National Workshop on Materials and Energy Conservation for Hot-Mix Asphalt scheduled for Nov. 1-2 in Indianapolis. See http://www.hotmix.org/view_article.php?ID=558.

National Partnership for Highway Quality. <http://www.nphq.org>. NPHQ draws together a dozen industry associations, FHWA, AASHTO, and the Texas Transportation Institute to foster cooperative activity between industry and state transportation agencies.